



2005 Minerals Yearbook

SWEDEN

THE MINERAL INDUSTRY OF SWEDEN

By Chin S. Kuo

Sweden's economy was export oriented and powered by its industrial production. The output of the mineral and manufacturing industries enabled Sweden to become a leading producing and exporting country in Europe. The gross domestic product (GDP) grew by 2.7% in 2005 compared with 3.7% in 2004. The country has abundant hydropower and timber in addition to a variety of mineral resources, particularly rich iron ore deposits. Sweden produced and exploited base metals, gold, industrial minerals, iron ore, and silver. The mineral industry mined metals and manufactured metal products. Owing to the lack of mineral fuels, the country depended on imports of crude oil to produce petroleum products for its domestic needs. The per capita GDP based on purchasing power parity was \$29,898, which was comparable to that of Finland but lower than that of Norway (International Monetary Fund, 2006^{§1}).

On July 1, 2005, the Natural Gas Act was replaced by a revised act that implemented the Natural Gas Directive. The directive requires the Government to designate the natural gas transmission and distribution system operators, who must be able to fulfill all the responsibilities of a system operator. Downstream network holders can enter into contracts for third-party access to the transmission and distribution systems. The directive imposes requirements on legal and functional unbundling only for transmission and distribution system operators. Sweden produced no natural gas in 2005 and the Swedish market for natural gas was limited (Claeson and Hagberg, 2005[§]).

Mawson Resources Ltd. of Canada discovered gold mineralization in outcrop at the Faboliden B prospect, which lies 4 kilometers (km) southwest of the Vargbacken prospect in northern Sweden. Mineralization at Faboliden B was similar in nature to Vargbacken and formed part of the same regional 13-km mineralized trend. Reconnaissance mapping identified quartz-vein-hosted gold mineralization within a metasediment sequence. Faboliden B was drilled in late September 2005 (Mawson Resources Ltd., 2005a).

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that totaled 160 meters (m) were drilled at Knaften toward a gold-mineralized zone north of Oran. Five core-drill holes that totaled 772 m were drilled south of Oran. Weak arsenopyrite mineralization was encountered in quartz diorite but it did not identify the gold mineralization (Lappland Goldminers AB, 2005b).

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Gold-Ore Resources Ltd. of Canada agreed to purchase 100% of the share capital of Bjorkdalsgruvan AB from Minmet plc of Ireland. The assets included the operating mine, plant, reserves/resources, and exploration properties of the Bjorkdal gold mine, which is located 30 km northwest of Skelleftea in northern Sweden. The mine contained measured and indicated reserves of 1.61 Mt at a grade of 1.94 g/t gold. The mine also contained measured and indicated resources of 6.87 Mt at a grade of 1.61 g/t gold and inferred resources of 3 Mt at a grade of 1.71 g/t gold. The plant's capacity was 1.3 million metric tons per year of ore, and gold recoveries were 90% using gravity concentration and a flotation circuit. An extensive regional and local geochemical database was included (CCNMatthews, 2005[§]).

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Major Source of Information

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TABLE 1
SWEDEN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2001	2002	2003	2004	2005	
METALS						
Aluminum, metal:						
Primary	101,800	100,600	101,200	101,400	102,600	
Secondary ^c	25,000	28,000	30,000	29,000	30,000	
Total	126,800	128,600	131,200	130,400	132,600	
Copper:						
Mine output, Cu content	74,269	76,200 ^r	96,000 ^r	90,600 ^r	97,800	
Metal:^c						
Smelter:						
Primary	173,000	188,000	185,000	206,000 ^r	192,000	
Secondary	35,000	35,000	30,000	30,000	30,000	
Total	208,000	223,000	215,000	236,000 ^r	222,000	
Refined:						
Primary	179,000	199,000	189,000	210,000	200,000	
Secondary	25,000	25,000	25,000	25,000	22,000	
Total	204,000	224,000	214,000	235,000	222,000	
Gold:						
Mine output, Au content	kilograms	4,986	4,500	4,300	5,200 ^r	4,400
Metal, primary ^{c, 2}	do.	8,000	8,000	8,000	8,000	8,000
Iron and steel, metal:						
Iron ore concentrate and pellets:^c						
Gross weight	thousand metric tons	19,486 ³	20,300	21,500	22,300	23,300
Fe content	do.	12,811 ³	13,400	14,100	14,700	15,300
Metal:						
Pig iron and sponge iron	do.	3,614	3,703	3,700 ^e	3,600 ^e	3,500 ^e
Ferrous alloys:						
Ferrosilicon		109,198	118,823	110,529	128,191 ^r	127,451
Ferrosilicon ^c		22,000	23,000	24,000	24,000	25,000
Total ^c		131,000	142,000	135,000	152,000 ^r	152,000
Steel, crude	thousand metric tons	5,518	5,754	5,707	5,949	6,000 ^e
Semimanufactures ^c	do.	4,500	4,600	4,600	4,700	4,700
Lead:						
Mine output, Pb content		85,975	43,000	51,000	54,300 ^r	58,700
Metal, refined:^c						
Primary		31,322 ³	30,000	24,200	30,200	30,000
Secondary		44,056 ³	39,700	52,000	52,000	50,000
Total		75,378 ³	69,700	76,200	82,200	80,000
Molybdenum, oxide, roasted, Mo content ^f		3,000	3,000	3,000	3,000	3,000
Nickel, metal, secondary ^c		50	50	50	50	50
Selenium, elemental, refined ^c		20	20	20	20	20
Silver:						
Mine output, Ag content	kilograms	306,029	293,900	306,800	292,600	267,200
Metal, primary ^{c, 2}	do.	250,000	250,000	250,000	250,000	250,000
Zinc, mine output, Zn content		156,334	148,600	185,900	197,000 ^r	214,600
INDUSTRIAL MINERALS						
Cement, hydraulic ^c	thousand metric tons	2,600 ³	2,700	2,650	2,700	2,800
Diamond, synthetic ^c	thousand carats	20,000	20,000	20,000	20,000	20,000
Feldspar, salable, crude and ground ^c		40,450 ³	40,000	41,000	42,000	43,000
Fertilizer, manufactured:^c						
Nitrogenous	thousand metric tons	400	400	400	400	400
Phosphatic	do.	10	10	10	10	10
Mixed	do.	300	300	300	300	300
Graphite ^c		963 ³	900	850	800	800
Lime ^c	thousand metric tons	550	580	590	590	600
Quartz and quartzite ^c	do.	600	600	600	700	700

See footnotes at end of table.

TABLE 1--Continued
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Commodity	2001	2002	2003	2004	2005	
INDUSTRIAL MINERALS--Continued:						
Stone:^c						
Dimension:						
Mostly unfinished	thousand metric tons	160	160	170	160	170
Granite	do.	128 ³	130	130	130	132
Limestone	do.	28 ³	30	32	32	32
Slate	do.	16 ³	15	15	15	16
Other	do.	5 ³	6	6	6	6
Crushed:						
Dolomite	do.	456 ³	450	440	430	450
Granite	do.	3,500	3,500	3,500	3,500	3,500
Limestone:						
Chalk	do.	70	70	80	80	80
For cement manufacture	do.	4,070 ³	4,000	3,950	3,900	4,000
For lime manufacture	do.	900	900	950	950	950
For other construction and industrial uses	do.	1,800	1,700	1,700	1,700	1,800
For agricultural uses	do.	550	600	650	600	650
For other uses	do.	1,500	1,500	1,500	1,500	1,500
Total	do.	8,890 ³	8,770	8,830	8,730	8,980
Sandstone	do.	5 ³	10	15	20	20
Undifferentiated	do.	30,000	30,000	30,000	30,000	30,000
Other	do.	371 ³	400	400	350	350
Sulfur:						
Metallurgy	do.	152	170 ^c	235	235	240
Petroleum	do.	55	60 ^c	57	59	60
Total	do.	207	230 ^c	292	294	300
Talc, soapstone ^c		15,000 ³	15,000	15,000	14,000	14,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical ^c	thousand metric tons	1,200	1,200	1,250	1,300	1,400
Gas, manufactured:^c						
Coke oven gas	million cubic meters	500	500	500	500	500
Blast furnace gas	do.	3,500	3,500	3,500	3,500	3,500
Peat:						
Agricultural use ^c	thousand cubic meters	1,400	1,800	1,800	1,100	1,200
Fuel	do.	2,496	2,885	2,633	1,866	1,900
Petroleum, refinery products:^c						
Liquefied petroleum gas	thousand 42-gallon barrels	3,000	3,000	3,000	3,000	4,000
Naphtha	do.	500	500	500	500	500
Gasoline, motor	do.	40,000	40,000	41,000	41,000	41,000
Jet fuel	do.	1,500	1,500	1,600	1,600	1,600
Kerosene	do.	50	50	50	50	50
Distillate fuel oil	do.	57,000	58,000	58,000	59,000	60,000
Residual fuel oil	do.	39,000	40,000	40,000	41,000	41,000
Other	do.	7,800	7,800	8,000	8,000	8,000
Refinery fuel and losses	do.	5,000	5,000	5,000	5,000	5,000
Total	do.	154,000	156,000	157,000	159,000	161,000

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ¹Revised.

¹Table includes data available through September 13, 2006.

²Includes only that recovered from indigenous ores excluding scrap.

³Reported figure.

TABLE 2
SWEDEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Granges AB (Glencore International AG, 100%)	Sundsvall smelter at Kubikenborg	100
Cement		Cementa AB (Scancem, 100%)	Plants at Degerhamn, Skovde, and Slite	3,400
Copper:				
Ore, copper content		Boliden Mineral AB	Mines at Aitik, Garpenberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	68
Do.		Outokumpu Oyj	Mines at Pahtohavare	22
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	240
Feldspar		Berglins Malm & Mineral AB (Omya GmbH)	Mines at Beckegruvan, Hojderna, and Limbergsbo	50
Do.		Forshammar Mineral AB (Omya GmbH)	Mines at Limberget and Ridrarhyttan	30
Do.		Larsbo Kalk AB (Omya GmbH)	Mines at Glanshamar and Larsbo	20
Ferroalloys		Vargon Alloys AB	Plant at Vargon	175
Gold:				
Ore, gold content	kilograms	International Gold Exploration AB (50%) and Dormant Properties AB (50%)	Bjorkdal Mine at Skellefte	3,000
Do.	do.	Boliden Mineral AB	Mines at Aitik, Akerberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	2,000
Metal	do.	do.	Smelter and refinery at Ronnskar	17,000
Graphite		Woxna Graphite AB (Tricorona Mineral AB, 100%)	Mine and plant at Kringeltjarn, Woxna	20
Iron and steel		Svenskt Stal AB (Government, 48%)	Steelworks at Borlange, Lulea, and Oxelosund	3,900
Iron ore		Luossavaara-Kiirunavaara AB (Government, 98%)	Mines at Kiruna and Malmberget	32,500
Kyanite		Svenska Kyanite AB (Svenska Mineral AB, 100%)	Quarry at Halskoberg	10
Lead:				
Ore, lead content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, Petiknas, and Renstrom	110
Do.		North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	20
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	115
Lime		Euroc Mineral AB	Plants at Limham, Koping, and Storugns	250
Do.		Svenska Mineral AB	Plants at Rattvik and Boda	250
Limestone		Kalproduction Storugns AB (Nordkalk AB, 100%)	Mines at Gotland Island	3,000
Marble	cubic meters	Borghamnsten AB	Quarry at Askersund	15,000
Petroleum, refined	42-gallon barrels per day	Skandinaviska Raffinaderi AB	Refinery at Lysekil	210,000
Do.		BP Raffinaderi AB	Refinery at Gothenburg	100,000
Do.		Shell Raffinaderi AB	do.	82,000
Do.		AB Nynas Petroleum	Refineries at Gothenburg, Malmo, and Nynashamn	54,000
Silver, metal	kilograms	Boliden Metals AB	Smelter and refinery at Ronnskar	408,000
Do.	do.	North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	25,000
Zinc, ore, zinc content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, and Renstrom	112
Do.		Zinkgruvan Mining AB (North Ltd., 100%)	Zinkgruvan Mine at Ammeberg	60

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Smelter:						
Primary	173,000	188,000	185,000	206,000 ^r	192,000	
Secondary	35,000	35,000	30,000	30,000	30,000	
Total	208,000	223,000	215,000	236,000 ^r	222,000	
Refined:						
Primary	179,000	199,000	189,000	210,000	200,000	
Secondary	25,000	25,000	25,000	25,000	22,000	
Total	204,000	224,000	214,000	235,000	222,000	
Gold:						
Mine output, Au content	kilograms	4,986	4,500	4,300	5,200 ^r	4,400
Metal, primary ^{c, 2}	do.	8,000	8,000	8,000	8,000	8,000
Iron and steel, metal:						
Iron ore concentrate and pellets:^c						
Gross weight	thousand metric tons	19,486 ³	20,300	21,500	22,300	23,300
Fe content	do.	12,811 ³	13,400	14,100	14,700	15,300
Metal:						
Pig iron and sponge iron	do.	3,614	3,703	3,700 ^e	3,600 ^e	3,500 ^e
Ferrous alloys:						
Ferrosilicon		109,198	118,823	110,529	128,191 ^r	127,451
Ferrosilicon ^c		22,000	23,000	24,000	24,000	25,000
Total ^c		131,000	142,000	135,000	152,000 ^r	152,000
Steel, crude	thousand metric tons	5,518	5,754	5,707	5,949	6,000 ^e
Semimanufactures ^c	do.	4,500	4,600	4,600	4,700	4,700
Lead:						
Mine output, Pb content		85,975	43,000	51,000	54,300 ^r	58,700
Metal, refined:^c						
Primary		31,322 ³	30,000	24,200	30,200	30,000
Secondary		44,056 ³	39,700	52,000	52,000	50,000
Total		75,378 ³	69,700	76,200	82,200	80,000
Molybdenum, oxide, roasted, Mo content ^f		3,000	3,000	3,000	3,000	3,000
Nickel, metal, secondary ^c		50	50	50	50	50
Selenium, elemental, refined ^c		20	20	20	20	20
Silver:						
Mine output, Ag content	kilograms	306,029	293,900	306,800	292,600	267,200
Metal, primary ^{c, 2}	do.	250,000	250,000	250,000	250,000	250,000
Zinc, mine output, Zn content		156,334	148,600	185,900	197,000 ^r	214,600
INDUSTRIAL MINERALS						
Cement, hydraulic ^c	thousand metric tons	2,600 ³	2,700	2,650	2,700	2,800
Diamond, synthetic ^c	thousand carats	20,000	20,000	20,000	20,000	20,000
Feldspar, salable, crude and ground ^c		40,450 ³	40,000	41,000	42,000	43,000
Fertilizer, manufactured:^c						
Nitrogenous	thousand metric tons	400	400	400	400	400
Phosphatic	do.	10	10	10	10	10
Mixed	do.	300	300	300	300	300
Graphite ^c		963 ³	900	850	800	800
Lime ^c	thousand metric tons	550	580	590	590	600
Quartz and quartzite ^c	do.	600	600	600	700	700

See footnotes at end of table.

TABLE 1--Continued
 SWEDEN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2001	2002	2003	2004	2005	
INDUSTRIAL MINERALS--Continued:						
Stone:^c						
Dimension:						
Mostly unfinished	thousand metric tons	160	160	170	160	170
Granite	do.	128 ³	130	130	130	132
Limestone	do.	28 ³	30	32	32	32
Slate	do.	16 ³	15	15	15	16
Other	do.	5 ³	6	6	6	6
Crushed:						
Dolomite	do.	456 ³	450	440	430	450
Granite	do.	3,500	3,500	3,500	3,500	3,500
Limestone:						
Chalk	do.	70	70	80	80	80
For cement manufacture	do.	4,070 ³	4,000	3,950	3,900	4,000
For lime manufacture	do.	900	900	950	950	950
For other construction and industrial uses	do.	1,800	1,700	1,700	1,700	1,800
For agricultural uses	do.	550	600	650	600	650
For other uses	do.	1,500	1,500	1,500	1,500	1,500
Total	do.	8,890 ³	8,770	8,830	8,730	8,980
Sandstone	do.	5 ³	10	15	20	20
Undifferentiated	do.	30,000	30,000	30,000	30,000	30,000
Other	do.	371 ³	400	400	350	350
Sulfur:						
Metallurgy	do.	152	170 ^e	235	235	240
Petroleum	do.	55	60 ^e	57	59	60
Total	do.	207	230 ^e	292	294	300
Talc, soapstone ^c		15,000 ³	15,000	15,000	14,000	14,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical ^c	thousand metric tons	1,200	1,200	1,250	1,300	1,400
Gas, manufactured:^c						
Coke oven gas	million cubic meters	500	500	500	500	500
Blast furnace gas	do.	3,500	3,500	3,500	3,500	3,500
Peat:						
Agricultural use ^e	thousand cubic meters	1,400	1,800	1,800	1,100	1,200
Fuel	do.	2,496	2,885	2,633	1,866	1,900
Petroleum, refinery products:^c						
Liquefied petroleum gas	thousand 42-gallon barrels	3,000	3,000	3,000	3,000	4,000
Naphtha	do.	500	500	500	500	500
Gasoline, motor	do.	40,000	40,000	41,000	41,000	41,000
Jet fuel	do.	1,500	1,500	1,600	1,600	1,600
Kerosene	do.	50	50	50	50	50
Distillate fuel oil	do.	57,000	58,000	58,000	59,000	60,000
Residual fuel oil	do.	39,000	40,000	40,000	41,000	41,000
Other	do.	7,800	7,800	8,000	8,000	8,000
Refinery fuel and losses	do.	5,000	5,000	5,000	5,000	5,000
Total	do.	154,000	156,000	157,000	159,000	161,000

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ¹Revised.

¹Table includes data available through September 13, 2006.

²Includes only that recovered from indigenous ores excluding scrap.

³Reported figure.

TABLE 2
SWEDEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2005

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Granges AB (Glencore International AG, 100%)	Sundsvall smelter at Kubikenborg	100
Cement		Cementa AB (Scancem, 100%)	Plants at Degerhamn, Skovde, and Slite	3,400
Copper:				
Ore, copper content		Boliden Mineral AB	Mines at Aitik, Garpenberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	68
Do.		Outokumpu Oyj	Mines at Pahtohavare	22
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	240
Feldspar		Berglins Malm & Mineral AB (Omya GmbH)	Mines at Beckegruvan, Hojderna, and Limbergsbo	50
Do.		Forshammar Mineral AB (Omya GmbH)	Mines at Limberget and Ridrarhyttan	30
Do.		Larsbo Kalk AB (Omya GmbH)	Mines at Glanshamar and Larsbo	20
Ferroalloys		Vargon Alloys AB	Plant at Vargon	175
Gold:				
Ore, gold content	kilograms	International Gold Exploration AB (50%) and Dormant Properties AB (50%)	Bjorkdal Mine at Skellefte	3,000
Do.	do.	Boliden Mineral AB	Mines at Aitik, Akerberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	2,000
Metal	do.	do.	Smelter and refinery at Ronnskar	17,000
Graphite		Woxna Graphite AB (Tricorona Mineral AB, 100%)	Mine and plant at Kringeltjarn, Woxna	20
Iron and steel		Svenskt Stal AB (Government, 48%)	Steelworks at Borlange, Lulea, and Oxelosund	3,900
Iron ore		Luossavaara-Kiirunavaara AB (Government, 98%)	Mines at Kiruna and Malmberget	32,500
Kyanite		Svenska Kyanite AB (Svenska Mineral AB, 100%)	Quarry at Halskoberg	10
Lead:				
Ore, lead content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, Petiknas, and Renstrom	110
Do.		North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	20
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	115
Lime		Euroc Mineral AB	Plants at Limham, Koping, and Storugns	250
Do.		Svenska Mineral AB	Plants at Rattvik and Boda	250
Limestone		Kalproduction Storugns AB (Nordkalk AB, 100%)	Mines at Gotland Island	3,000
Marble	cubic meters	Borghamnsten AB	Quarry at Askersund	15,000
Petroleum, refined	42-gallon barrels per day	Skandinaviska Raffinaderi AB	Refinery at Lysekil	210,000
Do.		BP Raffinaderi AB	Refinery at Gothenburg	100,000
Do.		Shell Raffinaderi AB	do.	82,000
Do.		AB Nynas Petroleum	Refineries at Gothenburg, Malmo, and Nynashamn	54,000
Silver, metal	kilograms	Boliden Metals AB	Smelter and refinery at Ronnskar	408,000
Do.	do.	North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	25,000
Zinc, ore, zinc content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, and Renstrom	112
Do.		Zinkgruvan Mining AB (North Ltd., 100%)	Zinkgruvan Mine at Ammeberg	60

